

REMARKS

By this Amendment, claims 8-9 and 13-16 are cancelled without prejudice or disclaimer to the subject matter therein. After entry of this Amendment, claims 1-12 and 17-20 will remain pending in the patent application. Reconsideration and allowance of the present patent application based on the foregoing amendments and following remarks are respectfully requested.

Entry of this Amendment is proper under 37 C.F.R. §1.116 as the amendments: (a) place the application in condition for allowance for the reasons discussed herein; (b) do not present any new issues that would require further consideration and/or search as the amendments merely amplify issues discussed throughout the prosecution; (c) do not present any additional claims without canceling a corresponding number of claims; and (d) place the application in better form for appeal, should an appeal be necessary. Entry of this Amendment is thus respectfully requested.

Claims 13-15 were rejected under 35 U.S.C. §102(b) based on Lai (U.S. Patent No. 6,034,805). Claim 8 was rejected under 35 U.S.C. §102(b) based on Carter (U.S. Patent No. 4,900,137). Claim 9 was rejected under 35 U.S.C. §103(a) based on Carter. Claim 16 was rejected under 35 U.S.C. §103(a) based on Lai in view of Leger (U.S. Patent No. 5,627,847). Claims 8-9 and 13-16 are withdrawn without prejudice or disclaimer, thus rendering moot the rejection of these claims.

Claims 1, 2, 7, 10 and 11 were rejected under 35 U.S.C. 103(a) based on Mori (U.S. Patent Application Publication No. 2002/0154282) in view of Lai. The rejection is respectfully traversed.

Claim 1 recites a lithographic apparatus comprising, *inter alia*, a beam delivery system comprising redirecting elements to redirect said beam from a radiation source to an illumination system wherein said radiation source is arranged to provide a beam having a predetermined polarization state and said redirecting elements are arranged to provide a minimum polarization related radiation loss, and wherein said beam delivery system is constructed and arranged to maintain the predetermined polarization state relative to each of said redirecting elements.

As conceded by the Examiner on page 5 of the Office Action, Mori fails to teach or suggest these features. The Examiner then relied on Lai as allegedly disclosing these features and contended that it would have been obvious to modify Mori in view of Lai's teachings.

Applicants respectfully disagree and submit that there is no motivation for the suggested modification.

Mori discloses a correction apparatus for correcting a shift between optical axes in two separate optical units of an exposure apparatus. (*See* paragraph [0016]). Mori discloses that the apparatus includes a light source unit 10, an optical system 20 and an apparatus body 30. (*See* FIG. 1). The apparatus body 30 includes the correction apparatus 100, which comprises mirrors 110 and 130 (identified by the Office Action as the “redirecting elements” of claim 1), tilting members 112 and 132, drive units 114 and 134, Fourier lens 140, half mirror 150, detection optical system 160 and controller 170. (*See* paragraph [0048]).

Lai discloses an optical system for use with a deep-UV laser that includes mirrors arranged such that the reflections on the mirrors are of s-polarization. (*See* FIGS. 1 and 2). Lai discloses that the optical system eliminates high loss reflection of p-polarization. (*See* col. 2, lines 64-65).

Mori is, however, not concerned with arranging the mirrors 110 and 130 such that the reflections in the mirrors are of a predetermined polarization, much less an s-polarization. In fact, Mori discloses that if the mirrors are replaced by prism type optical members, it is necessary that the incident beam have a p-polarization and that the sides of the optical members be tilted at the Brewster angle. (*See* paragraphs [0052]-[0060]). As such, by virtue of being completely silent about using a radiation with a predetermined polarization state and maintaining such polarization state relative to each of the redirecting elements, and also by virtue of teaching that the beam must be p-polarized if mirrors 110 and 130 are replaced by prisms, it is respectfully submitted that it would not have been obvious to one of ordinary skill in the art to modify Mori in view of Lai. (*See* MPEP 2143).

It is also noted that the modification of Mori’s embodiments dealing with the polarization of the radiation beam in view of Lai would render Mori unsatisfactory for its intended purpose. Specifically, Mori teaches using a p-polarized beam in conjunction with prisms to enhance the reflections of the beam within the prisms. By contrast, Lai discloses using an s-polarized beam in the optical system. Clearly, the use of an s-polarized beam with the prisms of Mori would reduce the internal reflections within the prisms, thus defeating the intended purpose of Mori. Therefore, Applicants respectfully submit that there is no motivation for the suggested combination.

The Examiner alleged that “it would have been obvious to one of ordinary skill in the art ... to modify the radiation system of Mori to include redirecting elements constructed and

arranged to maintain the polarization state of the beam for at least the purpose of providing a more sufficient polarized beam to the projection system.” However, this *post hoc* justification for the asserted combination is clearly based on an improper application of hindsight based on Applicants’ own specification. There is no indication that Mori intends to provide a “more sufficient polarized beam to the projection system.” As mentioned previously, Mori is not concerned with maintaining the state of polarization relative to each of the redirecting elements. As such, Applicants respectfully submit that there is no motivation or suggestion for the asserted combination.

For at least these reasons, Applicants respectfully submit that the Office Action has failed to establish a *prima facie* case of obviousness per MPEP 2143.

Claims 2 and 7 are patentable over Mori, Lai and a combination thereof at least by virtue of their dependency from claim 1 and for the additional features recited therein.

Claim 10 is patentable over Mori, Lai and a combination thereof for at least similar reasons as provided in claim 1 and for the additional features recited therein. Namely, claim 10 is patentable at least because there is no motivation for the suggested combination.

Claim 11 is patentable over Mori, Lai and a combination thereof at least by virtue of its dependency from claim 10 and for the additional features recited therein.

Accordingly, reconsideration and withdrawal of the rejection of claims 1, 2, 7, 10 and 11 under 35 U.S.C. 103(a) based on Mori in view of Lai are respectfully requested.

Claim 12 was rejected under 35 U.S.C. 103(a) based on Mori in view of Lai and Leger.

Claim 12 is patentable over Mori, Lai and a combination thereof at least by virtue of its dependency from claim 10 and for the additional features recited therein. Namely, claim 12 is patentable at least because there is no motivation or suggestion to modify Mori in view of Lai.

Furthermore, Applicants respectfully submit that there is no motivation or suggestion to combine Leger with Mori and/or Lai.

The Office Action indicated that “it would have been obvious to one of ordinary skill in the art ... to further modify the beam of Mori, as modified, by having a substantially square cross section of radiation for at least the purpose to reduce the number of beam of reflections.” However, and as mentioned in Applicants’ last Response, this *post hoc* justification for the asserted combination is clearly based on an improper application of hindsight based on Applicants’ own specification, (see paragraph [0052] of the present

application), which is clearly prohibited by the Rules. Specifically, the Examiner is respectfully reminded that “the teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure.” (See MPEP 2143 citing *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991), emphasis added). In the present case, there is no indication that Mori is concerned with the number of reflections in the apparatus. As such, Applicants respectfully submit that there is no motivation or suggestion for the asserted combination.

Accordingly, reconsideration and withdrawal of the rejection of claim 12 under 35 U.S.C. 103(a) based on Mori in view of Lai and Leger are respectfully requested.

Claims 3-6 and 17 were rejected under 35 U.S.C. 103(a) based on Mori in view of Lai and Takahara *et al.* (U.S. 2002/0067546) (hereinafter “Takahara”). The rejection is respectfully traversed at least because there is no motivation for the suggested combination.

Claims 3-6 are patentable at least by virtue of their dependency from claim 1 and for the additional features recited therein. As mentioned previously, there is no motivation or suggestion to combine the teachings of Mori with those of Lai. For at least this reason, the Examiner has failed to establish a *prima facie* case that would render claims 3-6 obvious.

The Examiner alleged on page 8 of the Office Action that “it would have been obvious to one of ordinary skill in the art at the time the invention was made to further modify the radiation system of Mori, as modified, by including a half lambda plate as a polarizing plate utilized in a manner described above for at least the purpose to utilize the efficient amount of light.” Applicants respectfully disagree.

As mentioned previously, Mori is not concerned with maintaining a predetermined state of radiation within the apparatus. As such, one of ordinary skill in the art would not be motivated to include a polarizing plate, much less a half lambda plate, to modify a polarization state of the radiation beam, as recited in claims 3 and 4.

The Examiner also alleged on page 8 of the Office Action that Takahara discloses a polarizing plate that is integral with one of the redirecting elements. Applicants respectfully disagree. Unlike claim 5, Takahara merely teaches that the plate 52 is detached/separate from element 51. Therefore, Applicants respectfully submit that Takahara does not teach or suggest the features of claim 5.

The Examiner further alleged on page 8 that “it would have been obvious ... to further modify the radiation system of Takahara by having the polarized plate integral with at least one of said redirecting elements for at least the purpose of providing a more substantial

polarized beam.” Applicants respectfully disagree. This *post hoc* justification for the asserted combination is clearly based on an improper application of hindsight based on Applicants’ own specification. There is no indication that Mori intends to provide a “more substantial polarized beam.” As mentioned previously, Mori is not concerned with maintaining the state of polarization relative to each of the redirecting elements. As such, Applicants respectfully submit that there is no motivation or suggestion for the asserted combination.

Claim 17 is patentable over Mori, Lai and Takahara for at least similar reasons as provided above in connection with claims 1 and 3-6 and for the additional features recited therein. Namely, claim 17 is patentable over the suggested combination at least because there is no motivation to modify Mori in view of Lai.

Furthermore, Applicants respectfully submit that there is no motivation to modify Mori in view of Lai and Takahara.

For example, if one were to modify Mori in view of Lai, one would end up with a lithographic apparatus outputting an s-polarized radiation beam and including parallel mirrors 110 and 130 arranged such that the s-polarization is parallel to the surface of the mirrors 110 and 130, as taught by Lai. As such, one would clearly not be motivated to further modify this arrangement by providing a polarizer between mirrors 110 and 130 (identified as the redirecting elements in the Office Action) to modify the radiation to an s-polarization state. Clearly, the use of such polarizing plate would not benefit or enhance Mori’s modified apparatus.

In addition, Applicants respectfully submit that the modification of Mori’s embodiments dealing with the polarization of the radiation beam in view of Lai would render Mori unsatisfactory for its intended purpose. Specifically, Mori teaches using a p-polarized beam in conjunction with prisms to enhance the reflections of the beam within the prisms. By contrast, Lai discloses using an s-polarized beam in the optical system, and Takahara discloses changing the polarization state with a half lambda plate. Clearly, the use of an s-polarized beam, as suggested by Lai, would defeat the intended purpose of Mori because it would reduce the internal reflections within the prism. Therefore, Applicants respectfully submit that there is no motivation for the suggested combination, *per* MPEP 2145.

Accordingly, reconsideration and withdrawal of the rejection of claims 3-6 and 17 under 35 U.S.C. §103(a) based on Mori in view of Lai and Takahara are respectfully requested.

Claims 18-20 were rejected under 35 U.S.C. §103(a) based on Mori in view of Lai, Takahara and Leger.

Claims 18-20 depend from claim 17 and are patentable for at least the same reasons provided above in connection with claim 17, and for the additional features recited therein. Namely, claims 18-20 are patentable at least because there is no motivation or suggestion to modify Mori in view of Lai and Takahara.

Similarly, Applicants respectfully submit that there is no motivation or suggestion to modify Mori in view of Takahara.

The Examiner alleged that “the ordinary artisan would have been motivated to further modify Mori as modified in a manner described above for at least the purpose to reduce the number of beam reflections.” However, and as mentioned previously, this post hoc justification for the asserted combination is clearly based on an improper application of hindsight based on Applicants’ own specification, (see paragraph [0052] of the present application), which is clearly prohibited by the Rules. Specifically, the Examiner is respectfully reminded that “the teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure.” (See MPEP 2143 citing *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991), emphasis added). In the present case, there is no indication that Mori is concerned with the number of reflections in the apparatus. As such, Applicants respectfully submit that there is no motivation or suggestion for the asserted combination.

Accordingly, reconsideration and withdrawal of the rejection of claims 18-20 under 35 U.S.C. §103(a) based on Mori in view of Lai, Takahara and Leger are respectfully requested.

Applicants have addressed all the Examiner’s rejections and objections and respectfully submit that the application is in condition for allowance. A notice to that effect is earnestly solicited. If any point remains in issue which the Examiner feels may be best resolved through a personal or telephone interview, please contact the undersigned at the telephone number listed below.

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Respectfully submitted,

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